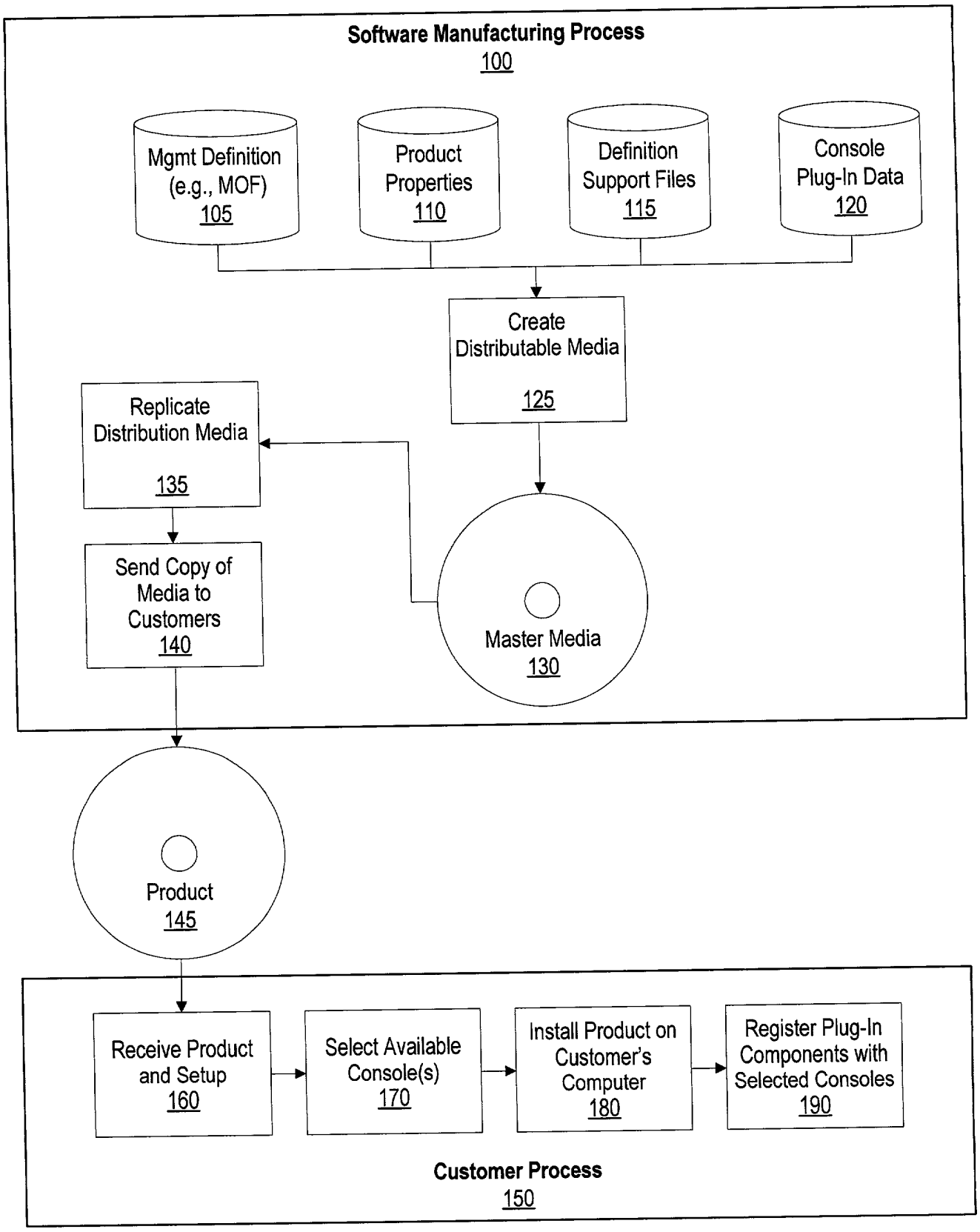
Software Manufacturing Process
100
Mgmt Definition (e.g., MOF)
105
Product Properties
110
Definition Support Files
115
Console Plug-In Data
120
Create Distributable Media
125
Replicate Distribution Media
135
Send Copy of Media to Customers
140
Master Media
130
Product
145
Receive Product and Setup
160
Select Available Console(s)
170
Install Product on Customer's Computer
180
Register Plug-In Components with Selected Consoles
190
Customer Process
150

Figure 1

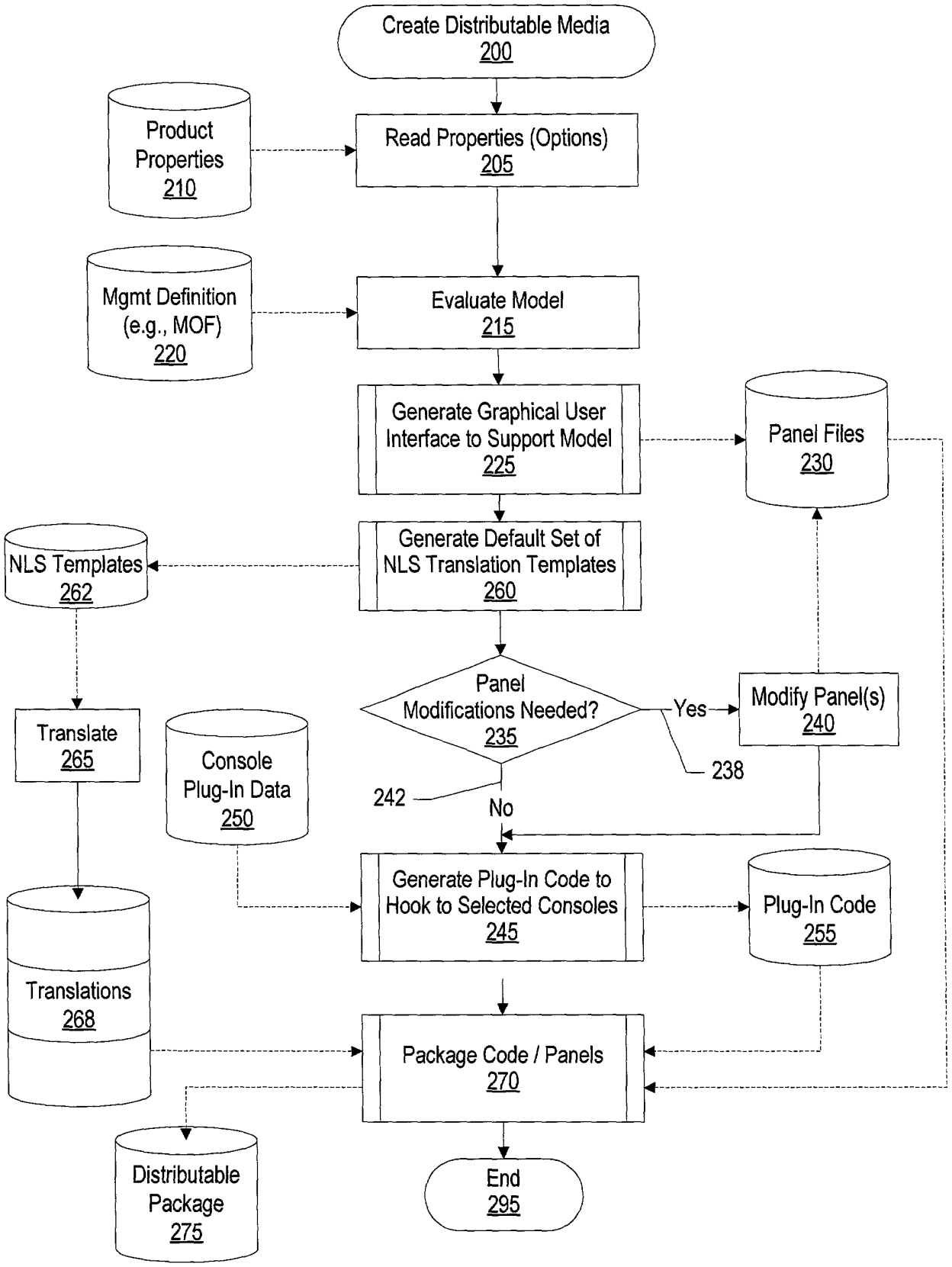
Create Distributable Media
200
Product Properties
210
Read Properties (Options)
205
Mgmt Definition (e.g., MOF)
220
Evaluate Model
215
Generate Graphical User Interface to Support Model
225
Panel Files
230
NLS Templates
262
Generate Default Set of NLS Translation Templates
260
Translate
265
Console Plug-In Data
250
Panel Modifications Needed?
235
Yes
Modify Panel(s)
240
238
242
No
Translations
268
Generate Plug-In Code to Hook to Selected Consoles
245
Plug-In Code
255
Package Code / Panels
270
Distributable Package
275
End
295

Figure 2

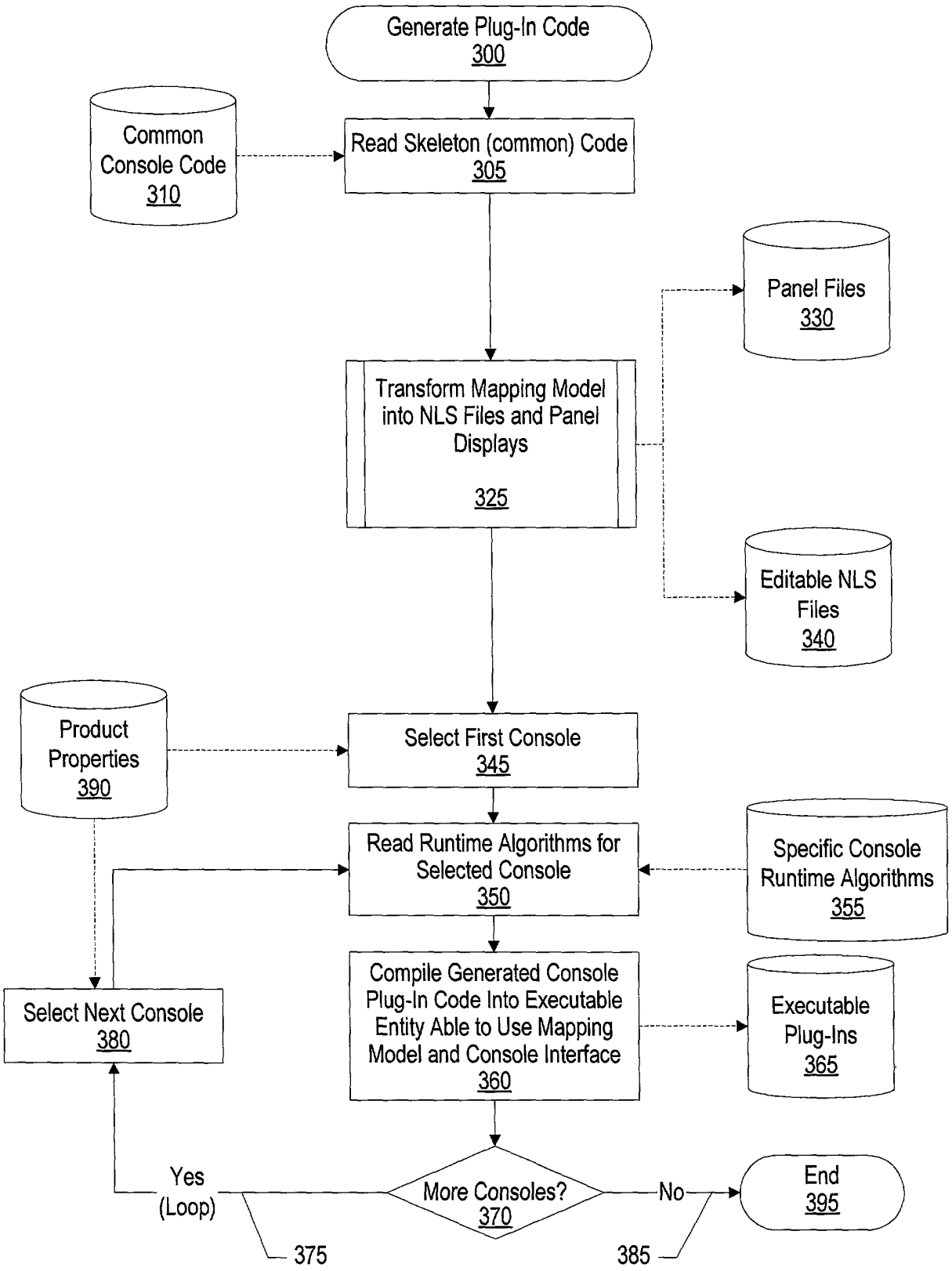
Generate Plug-In Code
300
Common Console Code
310
Read Skeleton (common) Code
305
Panel Files
330
Transform Mapping Model into NLS Files and Panel Displays
325
Editable NLS Files
340
Product Properties
390
Select First Console
345
Read Runtime Algorithms for Selected Console
350
Specific Console Runtime Algorithms
355
Compile Generated Console Plug-In Code Into Executable Entity Able to Use Mapping Model and Console Interface
360
Executable Plug-Ins
365
Select Next Console
380
More Consoles?
370
Yes
(Loop)
No
End
395
375
385

Figure 3

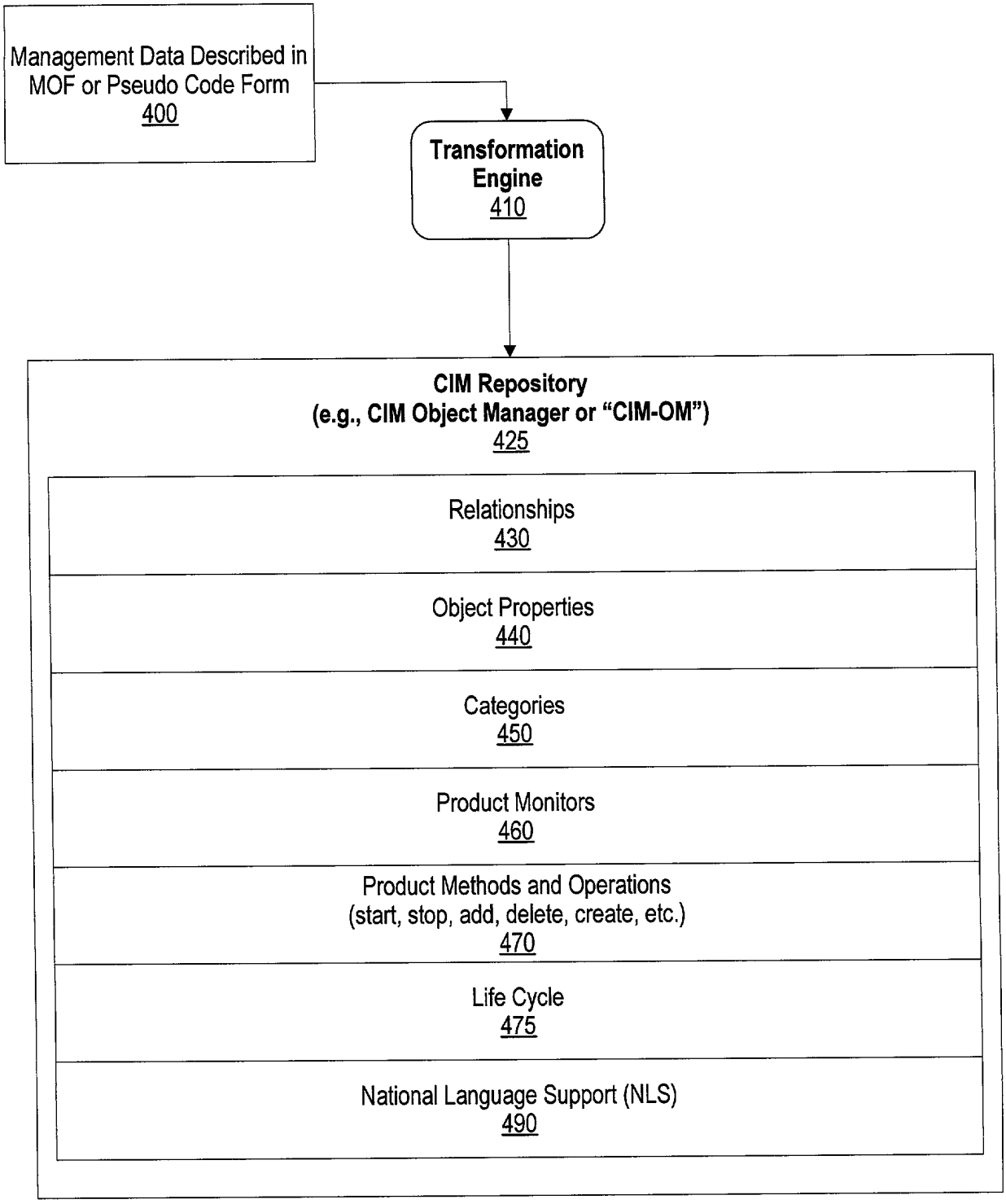
Management Data Described in MOF or Pseudo Code Form
400
Transformation Engine
410
CIM Repository
(e.g., CIM Object Manager or "CIM-OM")
425
Relationships
430
Object Properties
440
Categories
450
Product Monitors
460
Product Methods and Operations
(start, stop, add, delete, create, etc.)
470
Life Cycle
475
National Language Support (NLS)
490

Figure 4

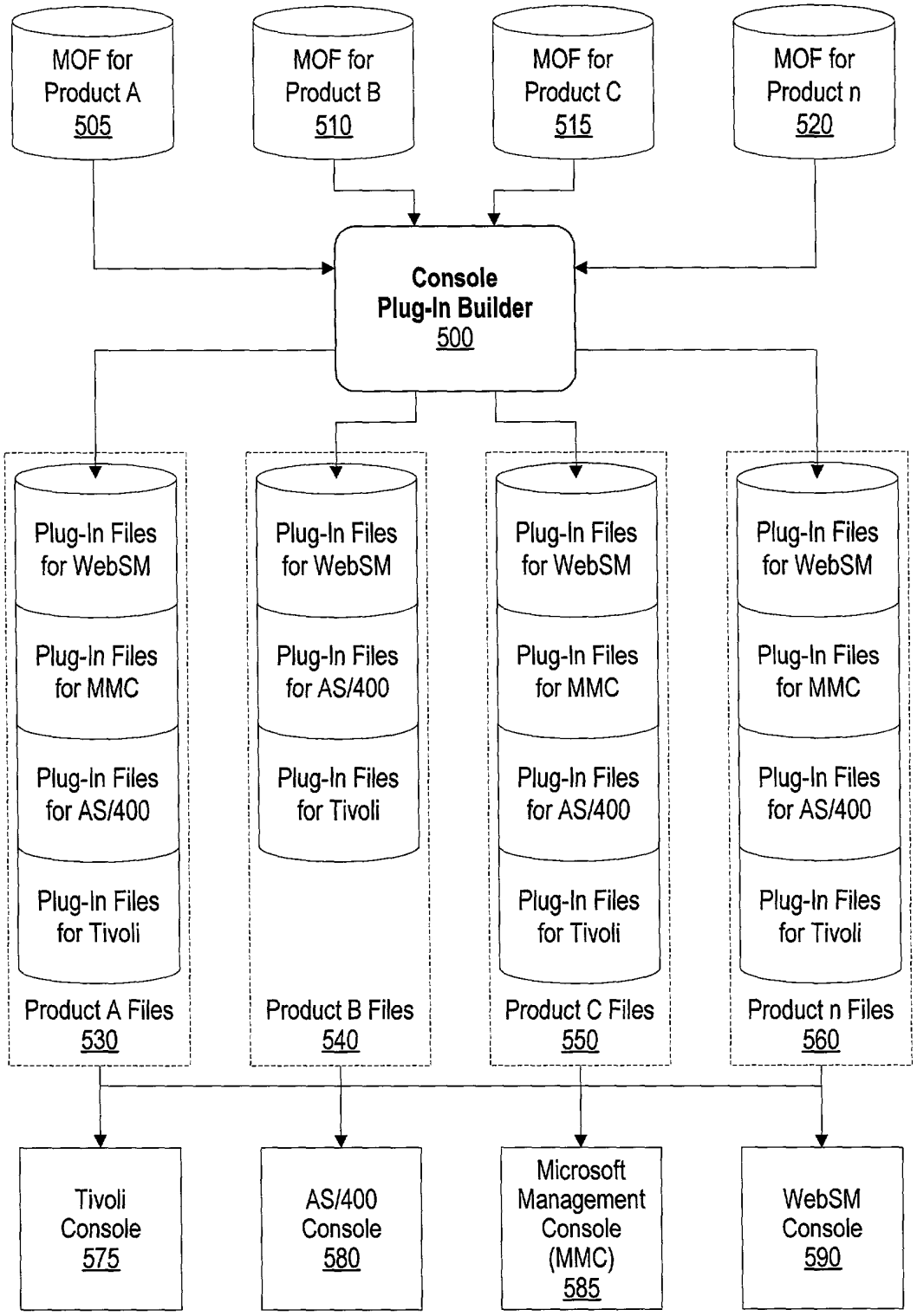
MOF for Product A 505
MOF for Product B 510
MOF for Product C 515
MOF for Product n 520
Console Plug-In Builder 500
Plug-In Files for WebSM
Plug-In Files for MMC
Plug-In Files for AS/400
Plug-In Files for Tivoli
Product A Files 530
Plug-In Files for WebSM
Plug-In Files for AS/400
Plug-In Files for Tivoli
Product B Files 540
Plug-In Files for WebSM
Plug-In Files for MMC
Plug-In Files for AS/400
Plug-In Files for Tivoli
Product C Files 550
Plug-In Files for WebSM
Plug-In Files for MMC
Plug-In Files for AS/400
Plug-In Files for Tivoli
Product n Files 560
Tivoli Console 575
AS/400 Console 580
Microsoft Management Console (MMC) 585
WebSM Console 590

Figure 5

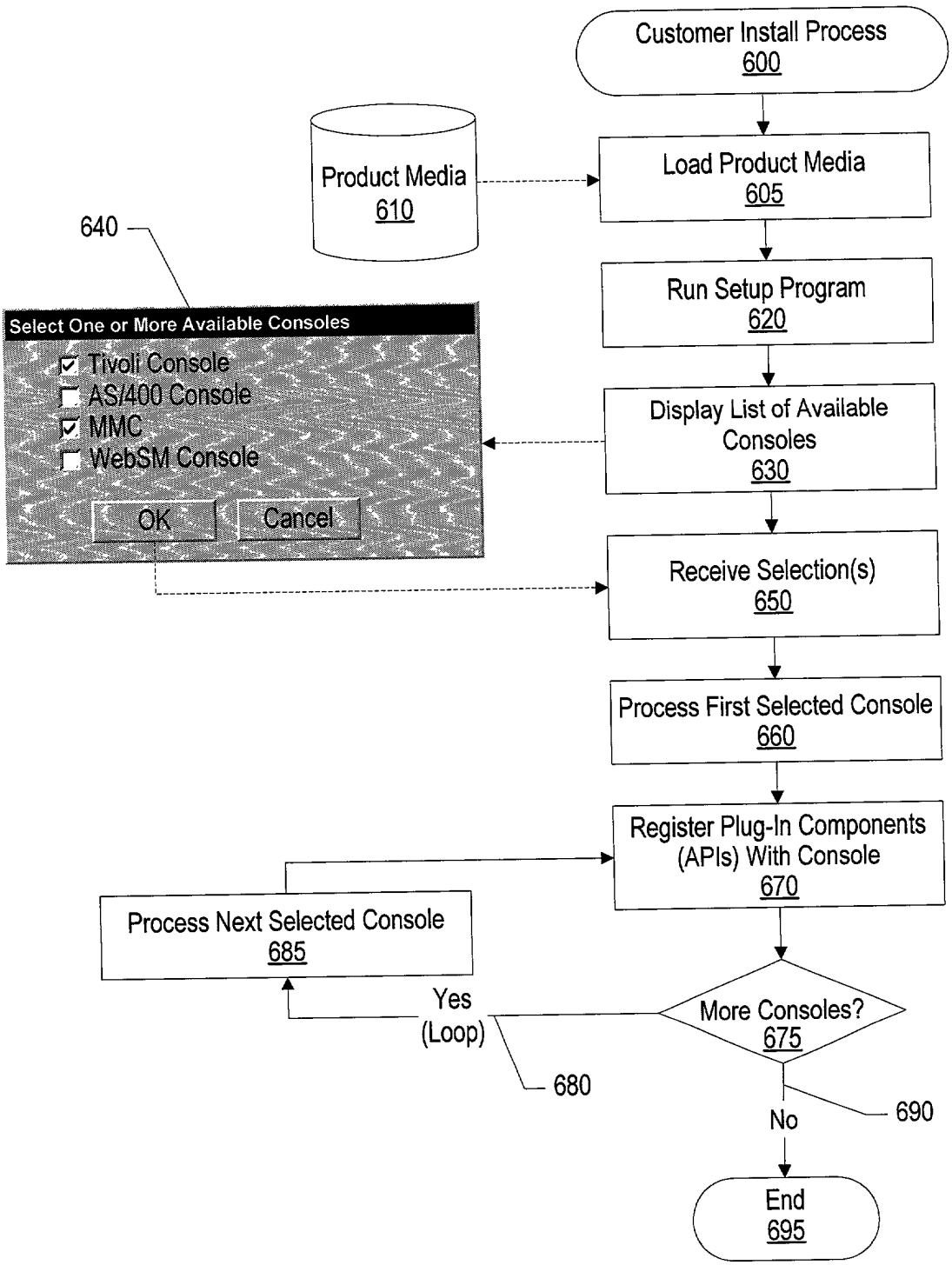
Customer Install Process
600
Product Media
610
Load Product Media
605
Run Setup Program
620
640
Select One or More Available Consoles
Tivoli Console
AS/400 Console
MMC
WebSM Console
OK
Cancel
Display List of Available Consoles
630
Receive Selection(s)
650
Process First Selected Console
660
Register Plug-In Components (APIs) With Console
670
Process Next Selected Console
685
More Consoles?
675
Yes
(Loop)
680
No
690
End
695

Figure 6

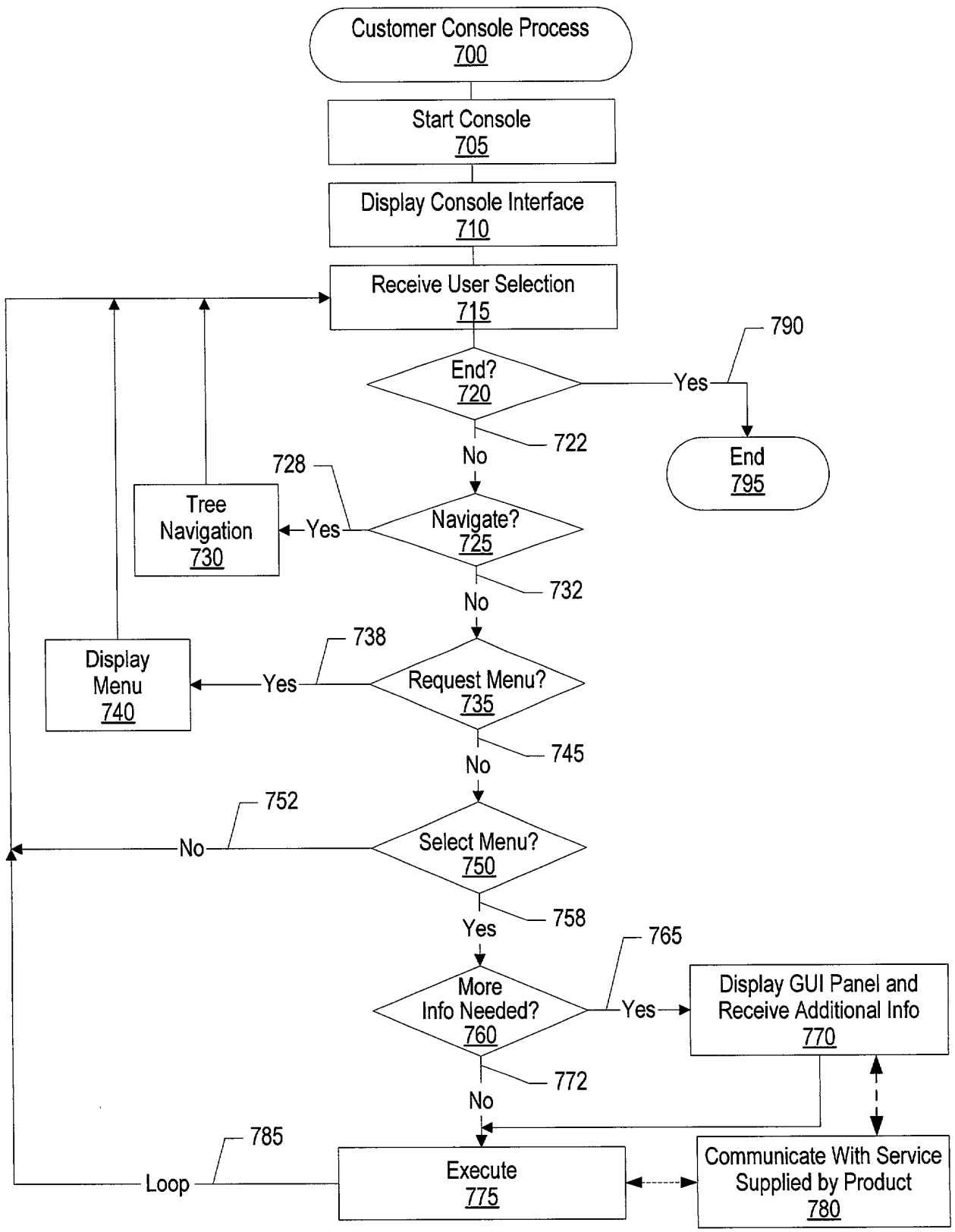
Customer Console Process
700
Start Console
705
Display Console Interface
710
Receive User Selection
715
End?
720
Yes
790
End
795
No
722
Navigate?
725
728
Yes
Tree Navigation
730
No
732
Request Menu?
735
738
Yes
Display Menu
740
No
745
Select Menu?
750
752
No
Yes
758
More Info Needed?
760
765
Yes
Display GUI Panel and Receive Additional Info
770
No
772
Execute
775
785
Loop
Communicate With Service Supplied by Product
780

Figure 7

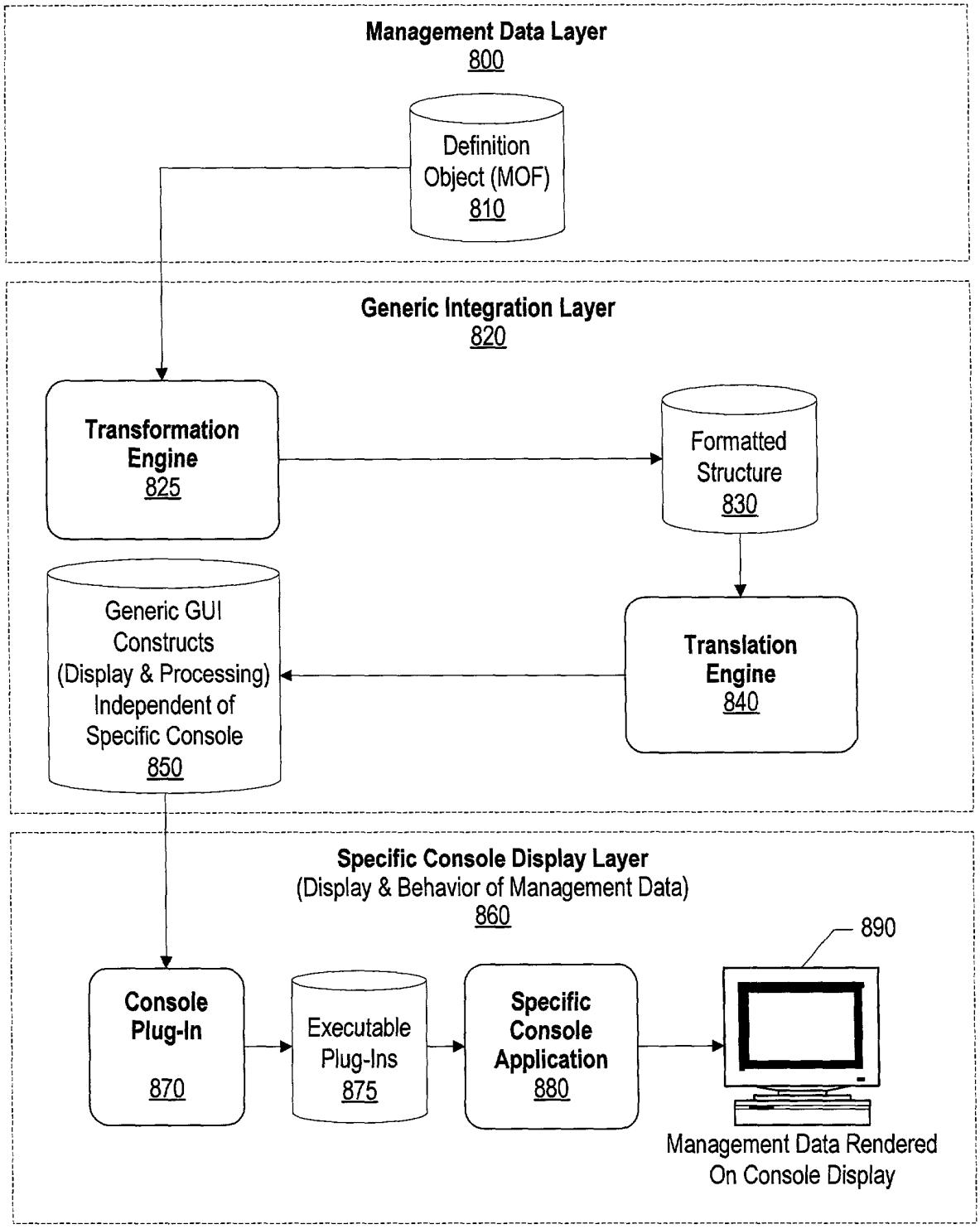
Management Data Layer
800
Definition Object (MOF)
810
Generic Integration Layer
820
Transformation Engine
825
Formatted Structure
830
Generic GUI Constructs (Display & Processing) Independent of Specific Console
850
Translation Engine
840
Specific Console Display Layer
(Display & Behavior of Management Data)
860
890
Console Plug-In
870
Executable Plug-Ins
875
Specific Console Application
880
Management Data Rendered On Console Display

Figure 8

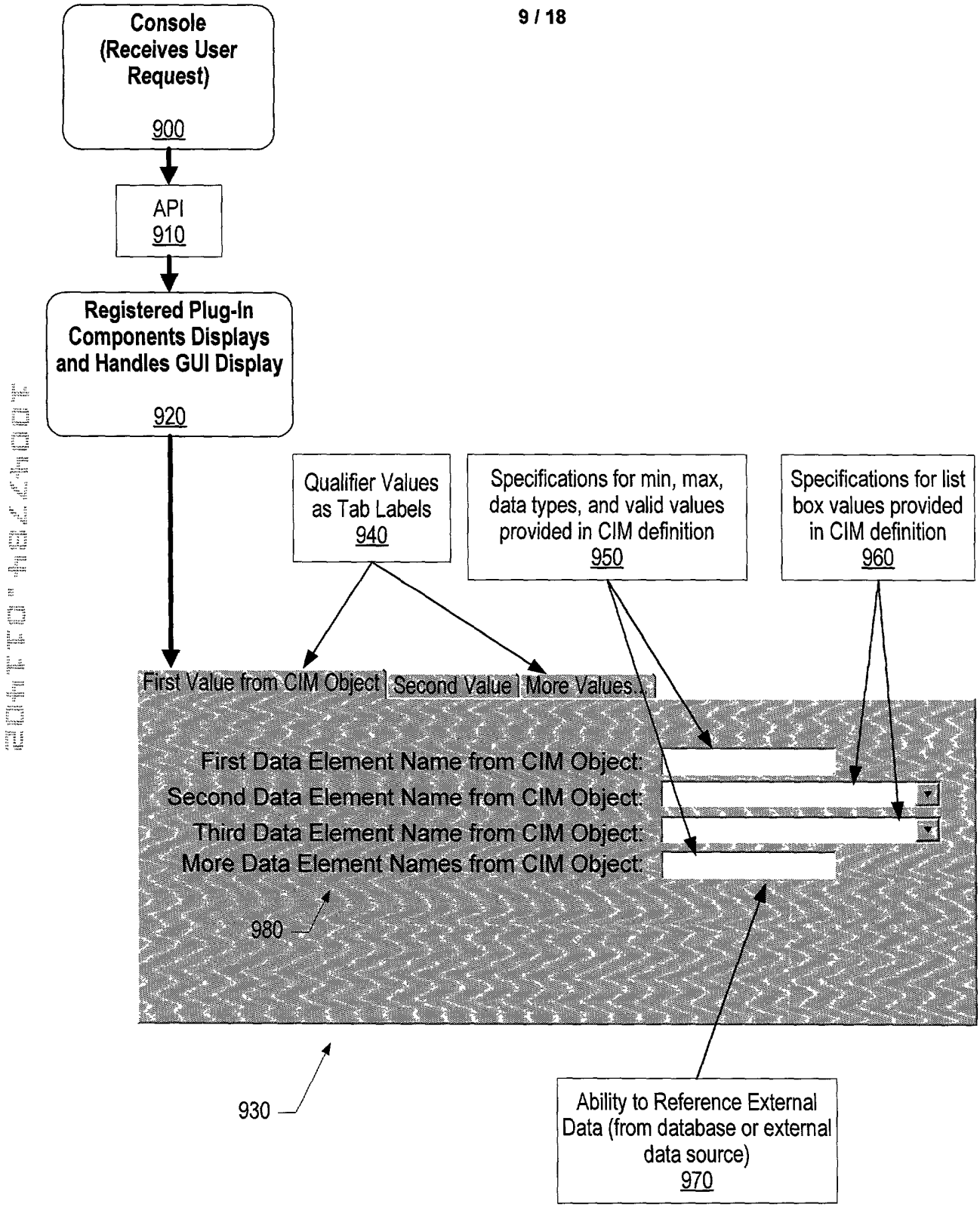
Console (Receives User Request)
900
API
910
Registered Plug-In Components Displays and Handles GUI Display
920
Qualifier Values as Tab Labels
940
Specifications for min, max, data types, and valid values provided in CIM definition
950
Specifications for list box values provided in CIM definition
960
First Value from CIM Object
Second Value
More Values...
First Data Element Name from CIM Object:
Second Data Element Name from CIM Object:
Third Data Element Name from CIM Object:
More Data Element Names from CIM Object:
980
930
Ability to Reference External Data (from database or external data source)
970

Figure 9

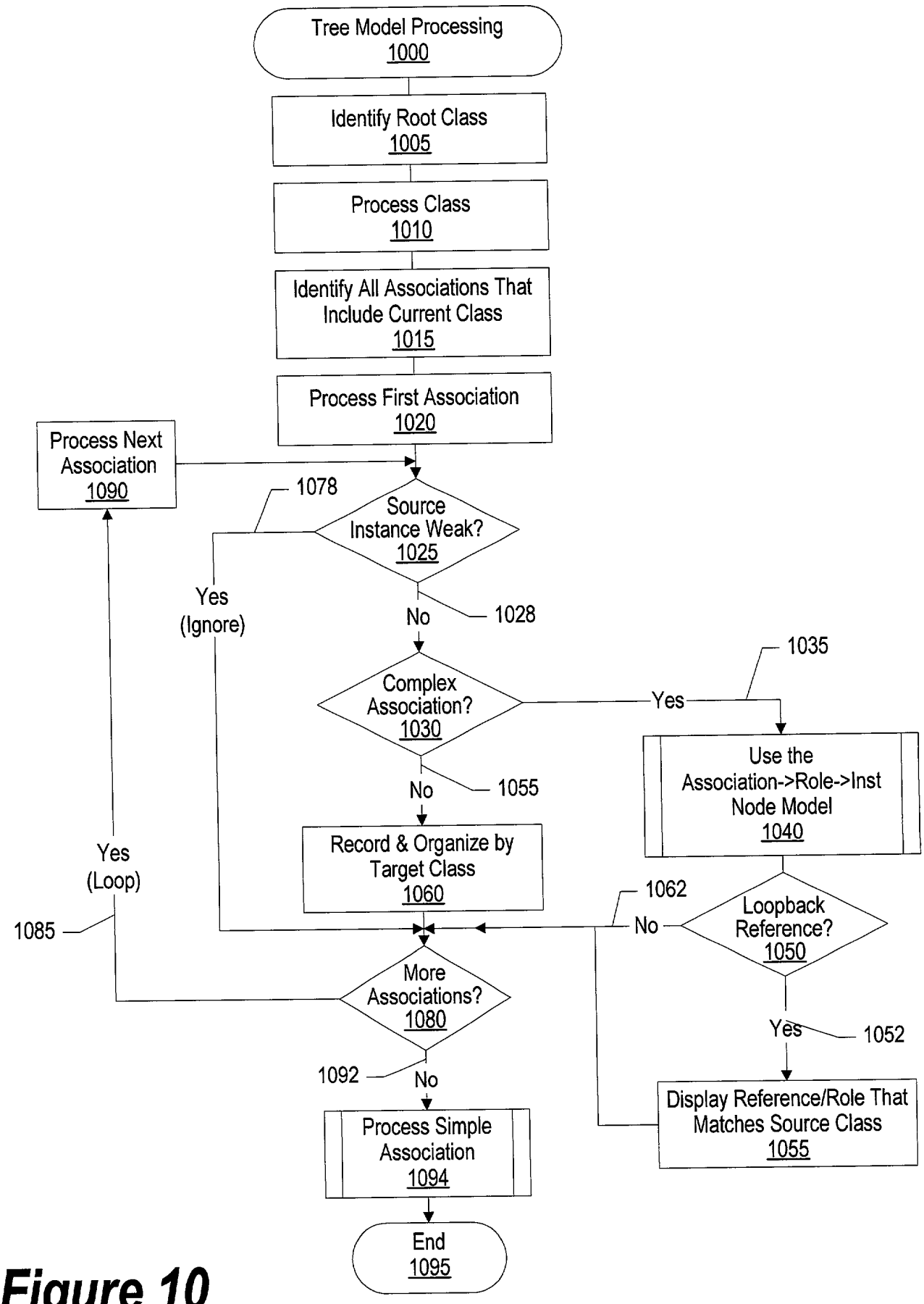
Tree Model Processing
1000
Identify Root Class
1005
Process Class
1010
Identify All Associations That Include Current Class
1015
Process First Association
1020
Process Next Association
1090
1078
Source Instance Weak?
1025
Yes (Ignore)
No
1028
Complex Association?
1030
Yes
1035
Use the Association->Role->Inst Node Model
1040
No
1055
Record & Organize by Target Class
1060
Yes (Loop)
1085
1062
No
Loopback Reference?
1050
More Associations?
1080
Yes
1052
1092
No
Display Reference/Role That Matches Source Class
1055
Process Simple Association
1094
End
1095

Figure 10

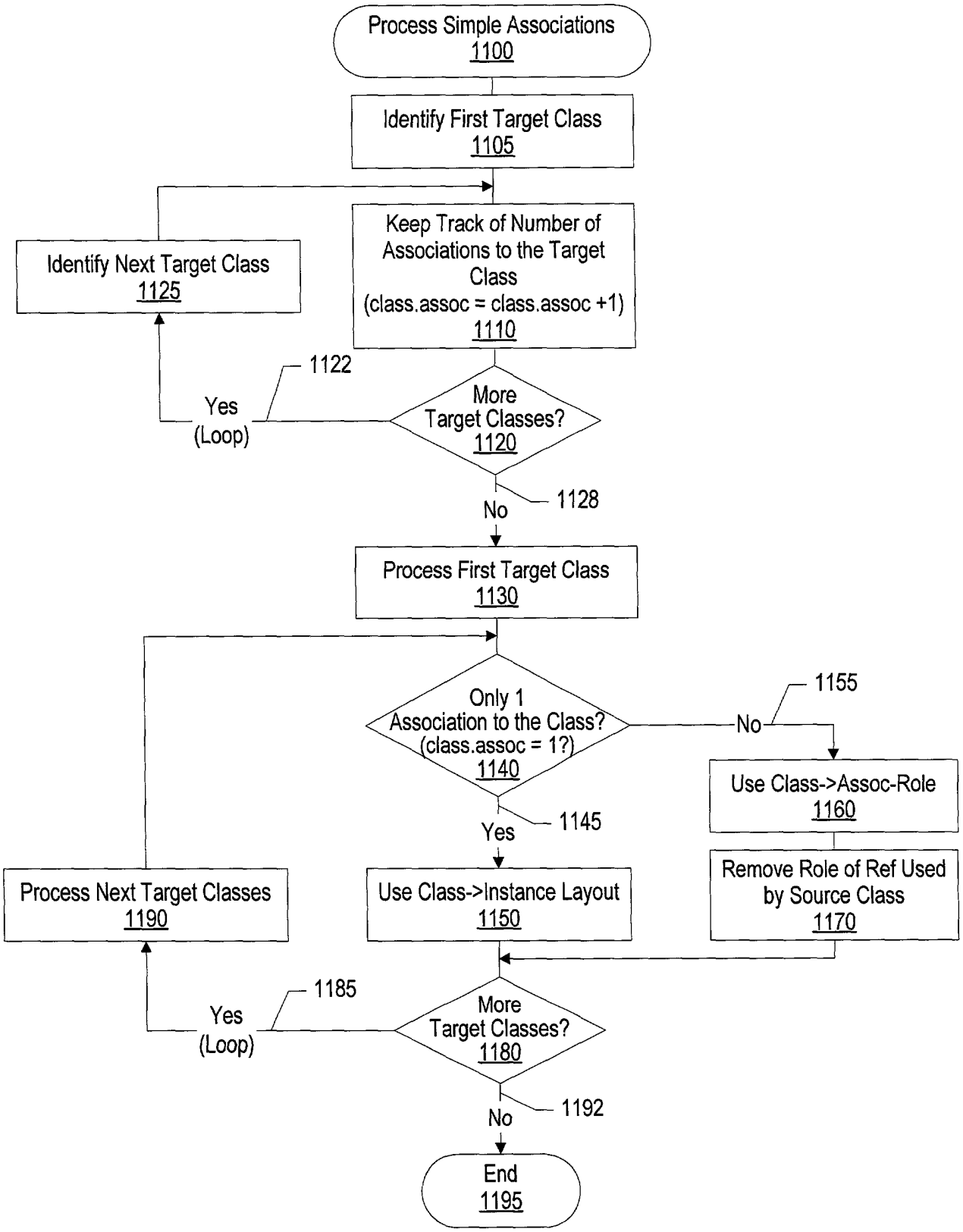
Process Simple Associations
1100
Identify First Target Class
1105
Keep Track of Number of Associations to the Target Class
(class.assoc = class.assoc +1)
1110
More Target Classes?
1120
1122
Yes
(Loop)
Identify Next Target Class
1125
No
1128
Process First Target Class
1130
Only 1 Association to the Class?
(class.assoc = 1?)
1140
1155
No
Use Class->Assoc-Role
1160
Remove Role of Ref Used by Source Class
1170
Yes
1145
Use Class->Instance Layout
1150
Process Next Target Classes
1190
More Target Classes?
1180
1185
Yes
(Loop)
No
1192
End
1195

Figure 11

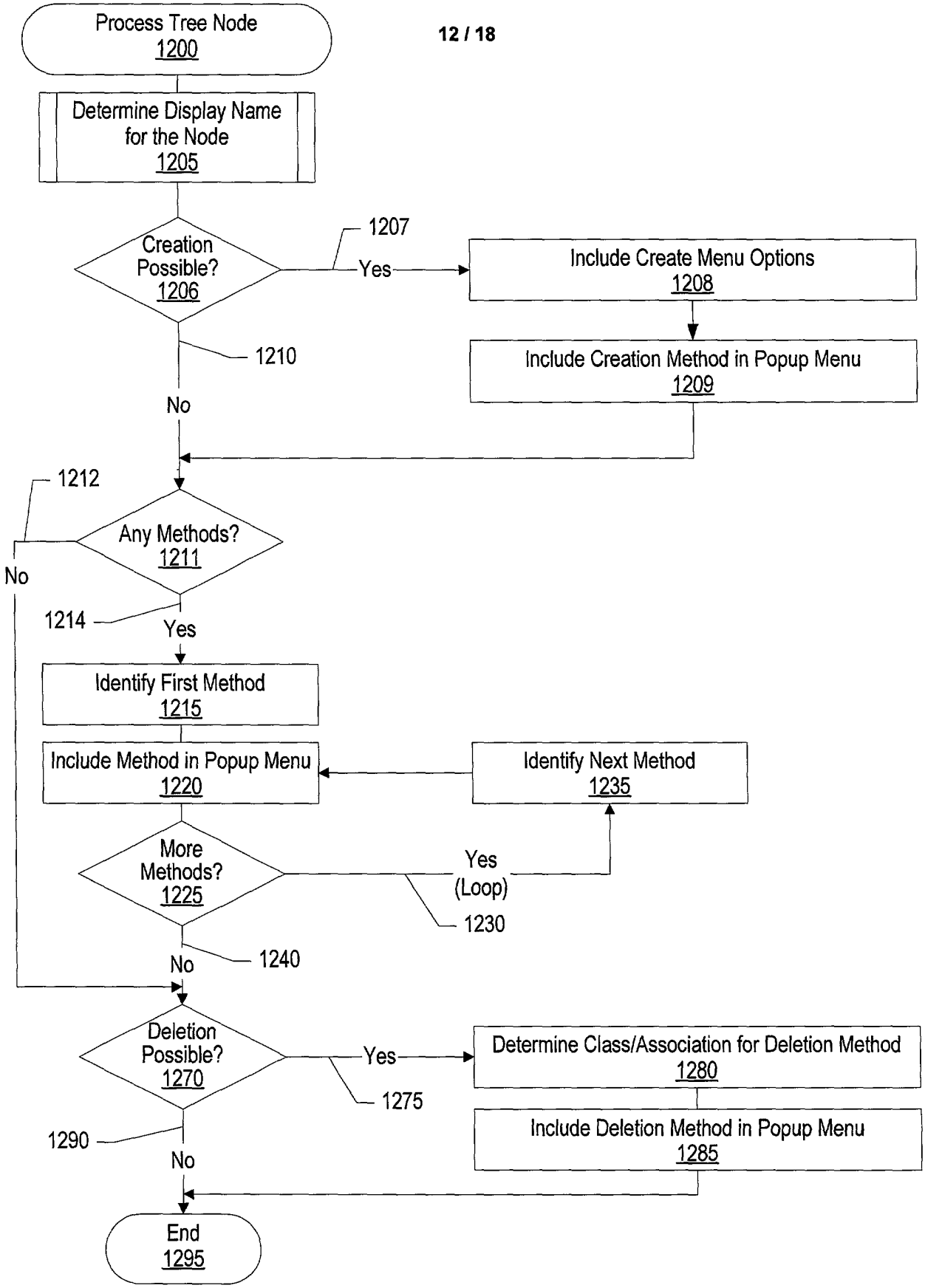
Process Tree Node
1200
Determine Display Name for the Node
1205
Creation Possible?
1206
1207
Yes
Include Create Menu Options
1208
Include Creation Method in Popup Menu
1209
1210
No
1212
Any Methods?
1211
No
1214
Yes
Identify First Method
1215
Include Method in Popup Menu
1220
Identify Next Method
1235
More Methods?
1225
Yes
(Loop)
1230
No
1240
Deletion Possible?
1270
Yes
1275
Determine Class/Association for Deletion Method
1280
Include Deletion Method in Popup Menu
1285
1290
No
End
1295

Figure 12

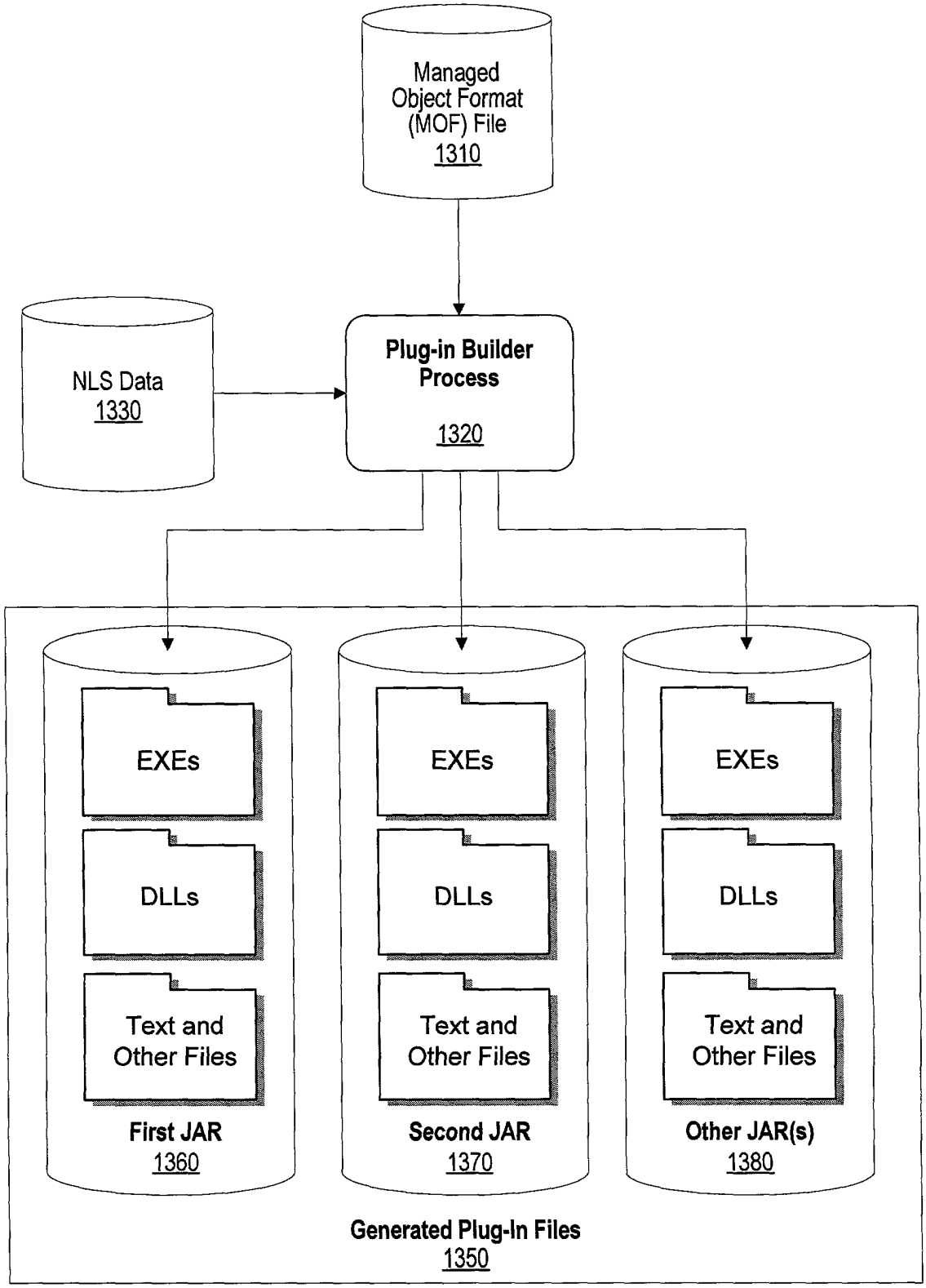
Managed Object Format (MOF) File
1310
NLS Data
1330
Plug-in Builder Process
1320
EXEs
DLLs
Text and Other Files
First JAR
1360
EXEs
DLLs
Text and Other Files
Second JAR
1370
EXEs
DLLs
Text and Other Files
Other JAR(s)
1380
Generated Plug-In Files
1350

Figure 13

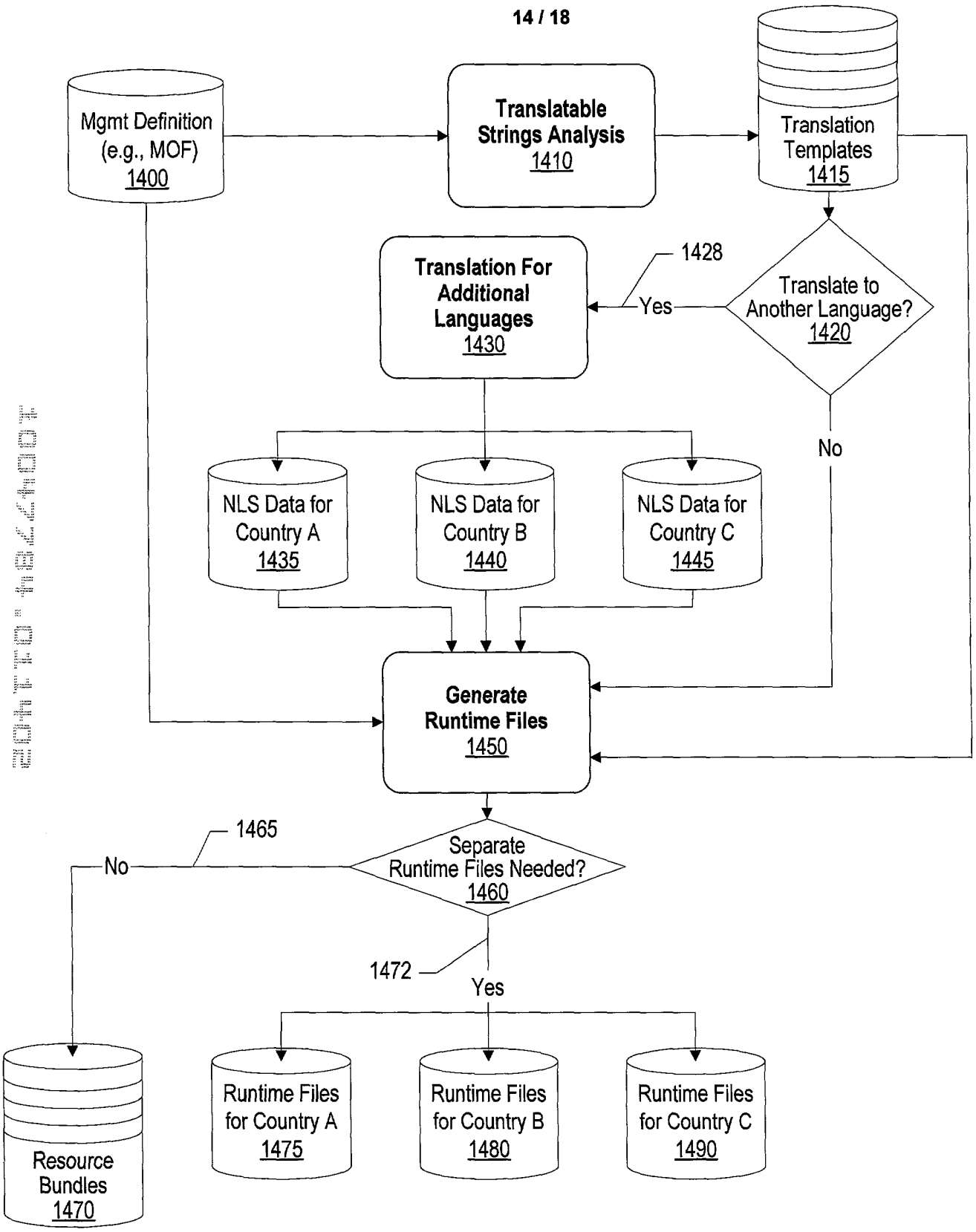
Mgmt Definition (e.g., MOF) 1400
Translatable Strings Analysis 1410
Translation Templates 1415
Translate to Another Language? 1420
1428
Yes
Translation For Additional Languages 1430
No
NLS Data for Country A 1435
NLS Data for Country B 1440
NLS Data for Country C 1445
Generate Runtime Files 1450
1465
No
Separate Runtime Files Needed? 1460
1472
Yes
Resource Bundles 1470
Runtime Files for Country A 1475
Runtime Files for Country B 1480
Runtime Files for Country C 1490

Figure 14

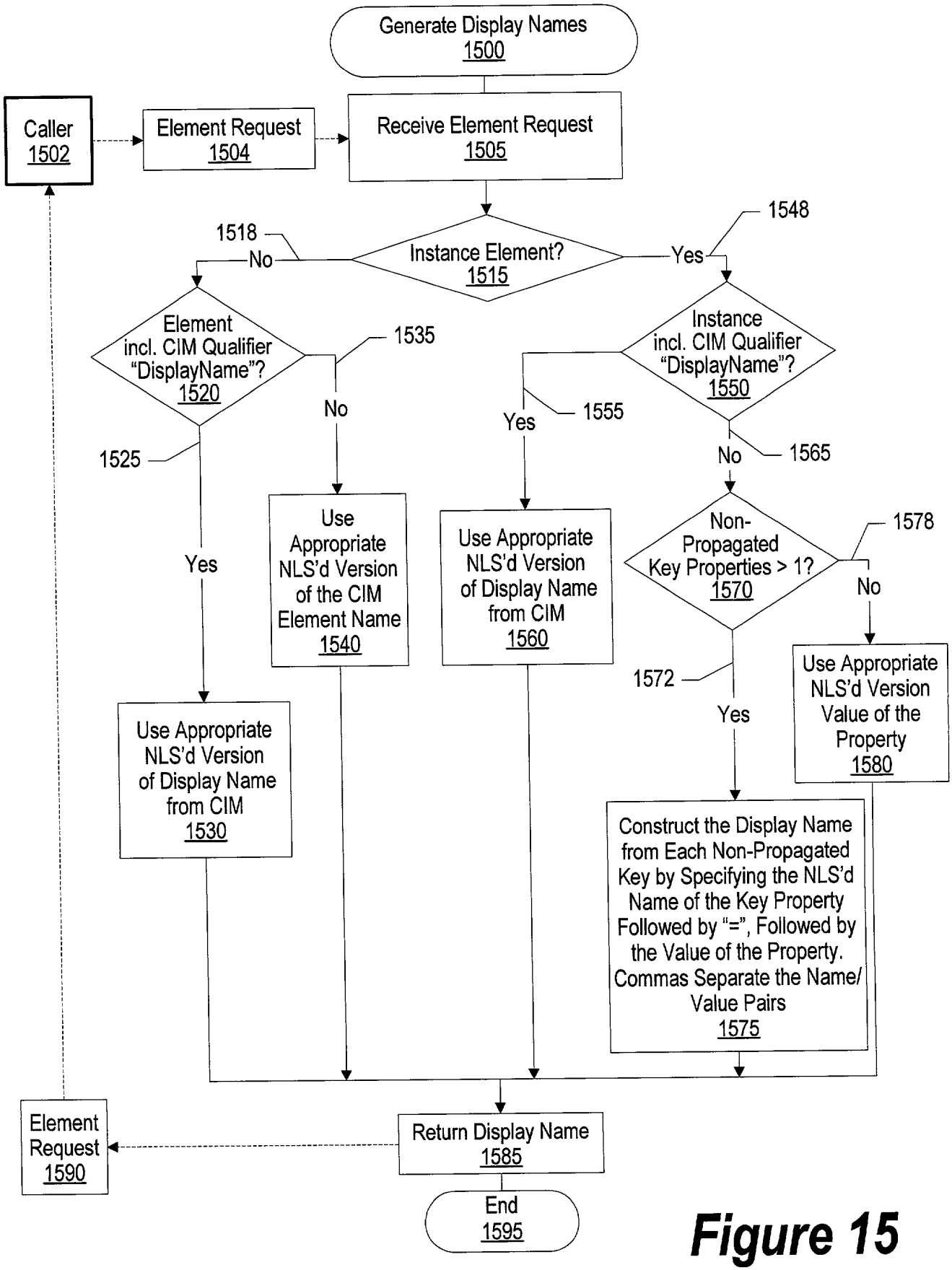
Generate Display Names 1500
Caller 1502
Element Request 1504
Receive Element Request 1505
Instance Element? 1515
1518
No
Yes
1548
Element incl. CIM Qualifier "DisplayName"? 1520
1535
No
1525
Yes
Instance incl. CIM Qualifier "DisplayName"? 1550
Yes
1555
No
1565
Use Appropriate NLS'd Version of the CIM Element Name 1540
Use Appropriate NLS'd Version of Display Name from CIM 1560
Non-Propagated Key Properties > 1? 1570
1578
No
1572
Yes
Use Appropriate NLS'd Version of Display Name from CIM 1530
Use Appropriate NLS'd Version Value of the Property 1580
Construct the Display Name from Each Non-Propagated Key by Specifying the NLS'd Name of the Key Property Followed by "=", Followed by the Value of the Property. Commas Separate the Name/ Value Pairs 1575
Element Request 1590
Return Display Name 1585
End 1595

Figure 15

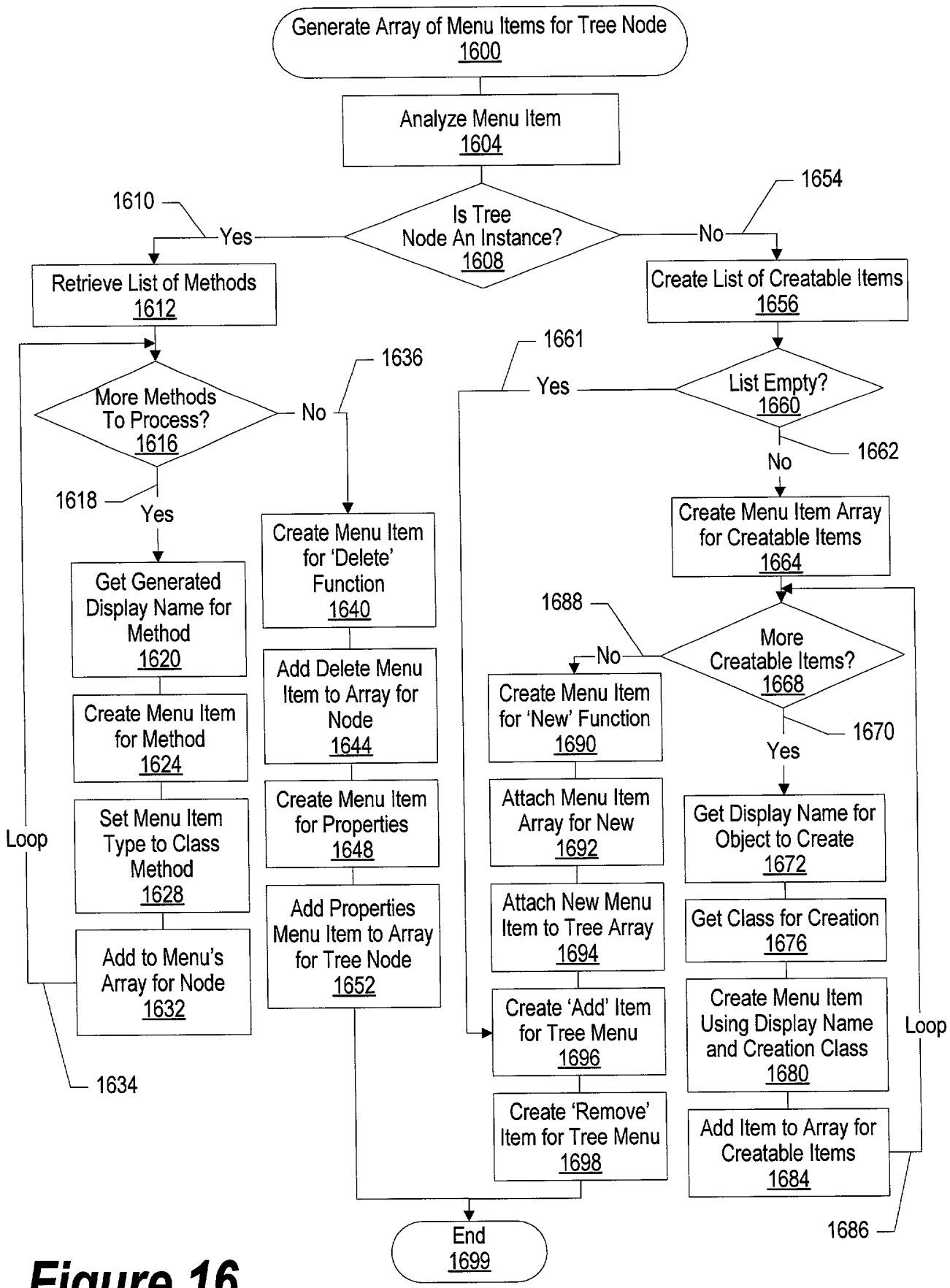
Generate Array of Menu Items for Tree Node 1600
Analyze Menu Item 1604
Is Tree Node An Instance? 1608
1610
Yes
No
1654
Retrieve List of Methods 1612
Create List of Creatable Items 1656
More Methods To Process? 1616
1636
No
1618
Yes
List Empty? 1660
1661
Yes
1662
No
Create Menu Item Array for Creatable Items 1664
Get Generated Display Name for Method 1620
Create Menu Item for 'Delete' Function 1640
1688
More Creatable Items? 1668
No
Create Menu Item for 'New' Function 1690
1670
Yes
Create Menu Item for Method 1624
Add Delete Menu Item to Array for Node 1644
Attach Menu Item Array for New 1692
Get Display Name for Object to Create 1672
Loop
Set Menu Item Type to Class Method 1628
Create Menu Item for Properties 1648
Attach New Menu Item to Tree Array 1694
Get Class for Creation 1676
Add to Menu's Array for Node 1632
Add Properties Menu Item to Array for Tree Node 1652
Create 'Add' Item for Tree Menu 1696
Create Menu Item Using Display Name and Creation Class 1680
Loop
1634
Create 'Remove' Item for Tree Menu 1698
Add Item to Array for Creatable Items 1684
1686
End 1699

Figure 16

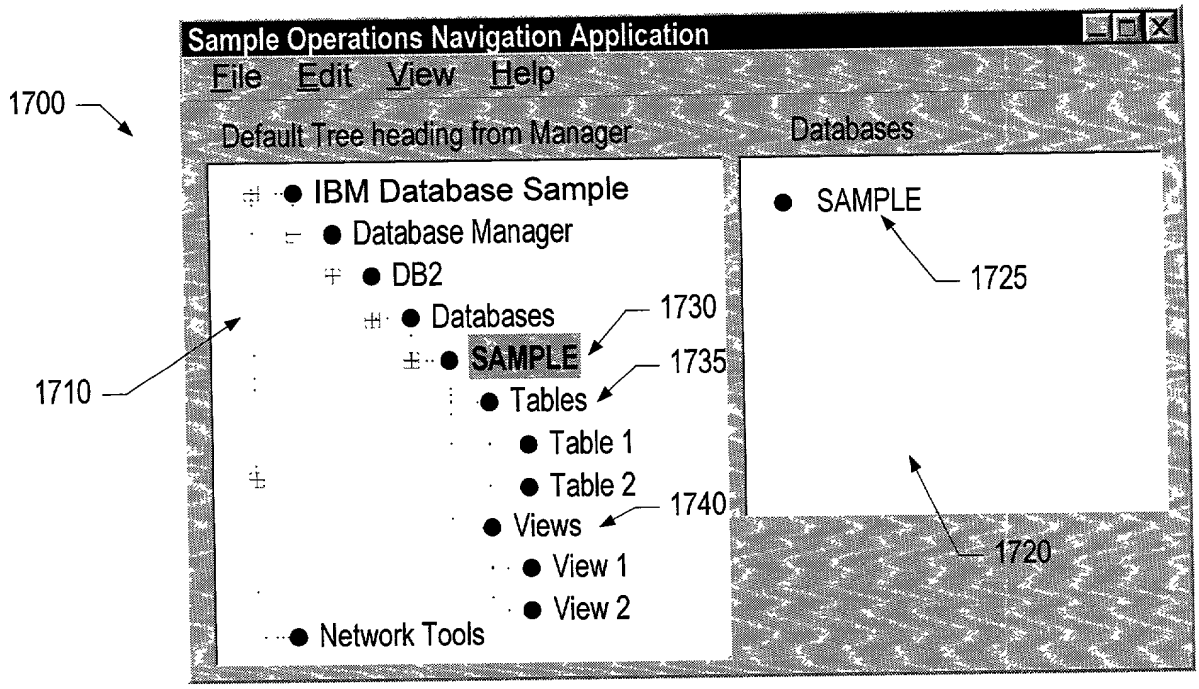

Figure 17a

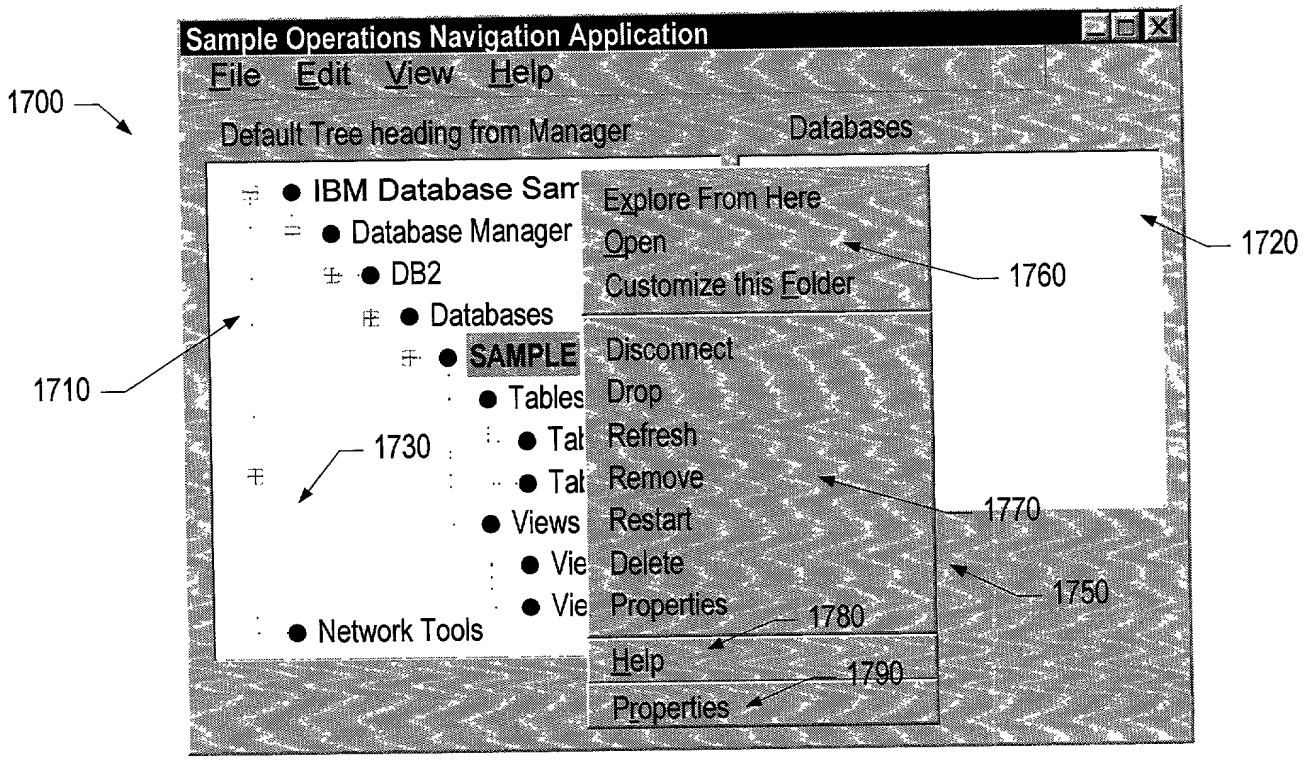

Figure 17b

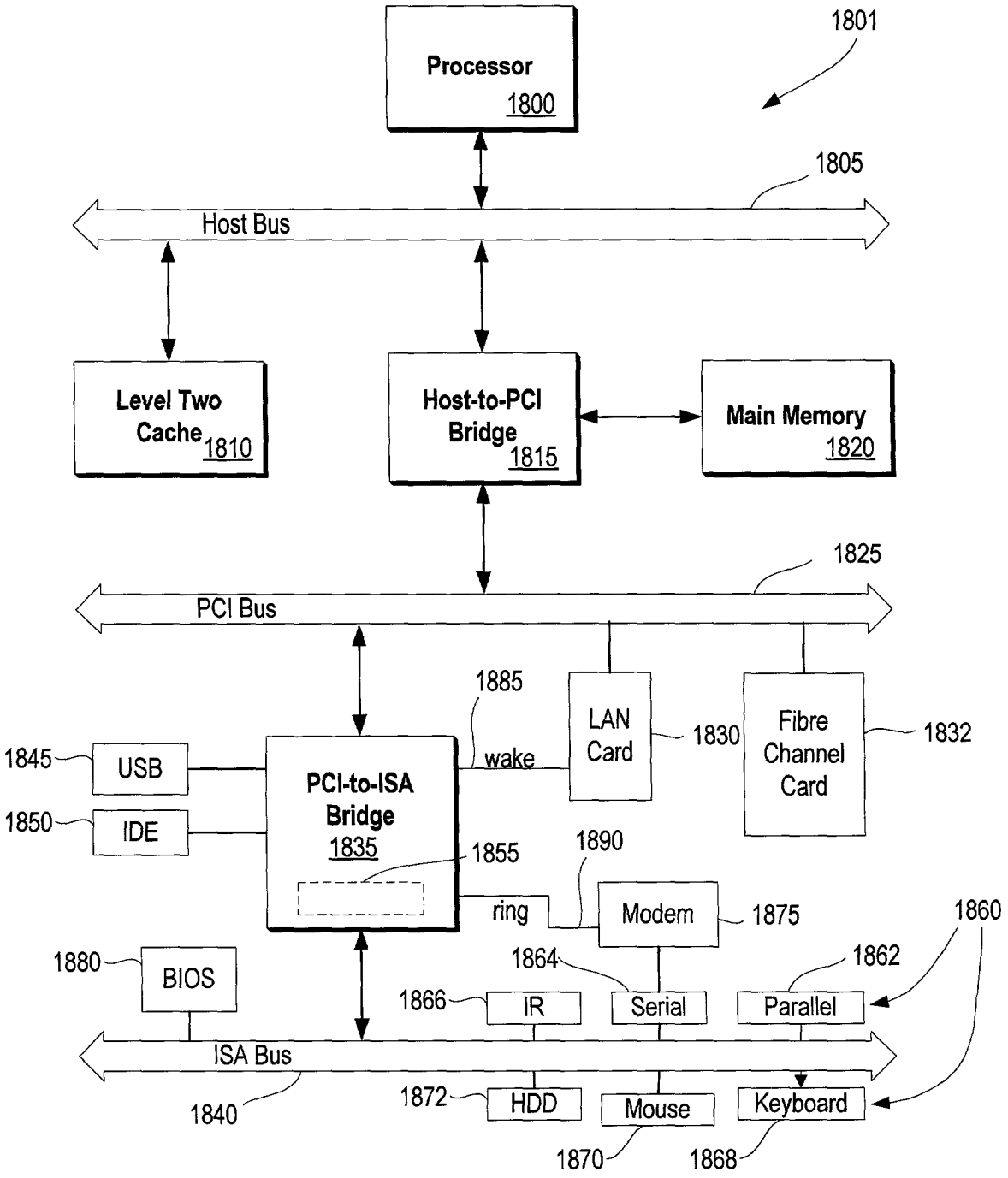
1801
Processor
1800
1805
Host Bus
Level Two Cache
1810
Host-to-PCI Bridge
1815
Main Memory
1820
1825
PCI Bus
1885
wake
LAN Card
1830
Fibre Channel Card
1832
1845
USB
1850
IDE
PCI-to-ISA Bridge
1835
1855
1890
ring
Modem
1875
1860
1880
BIOS
1864
1862
1866
IR
Serial
Parallel
ISA Bus
1840
1872
HDD
Mouse
Keyboard
1870
1868

Figure 18